

CLAIMS

1. A method of enabling user interaction with computer software running in a computer system via:
- 5 an interface surface containing information relating to the computer software and including coded data indicative of a signature field relating to the computer software; and
- a sensing device which, when placed in an operative position relative to the interface surface, senses indicating data indicative of the signature field and generates
- 10 movement data indicative of the sensing device's movement;
- the method including the steps of, in the computer system:
- (a) receiving the indicating data from the sensing device;
- (b) receiving the movement data from the sensing device;
- (c) identifying the signature field on the basis of the indicating data; and
- 15 (d) operating the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.
2. A method according to claim 1, including the step of verifying that the movement data represents a handwritten signature of the user.
- 20 3. A method according to claim 2, including the step of identifying the user.
4. A method according to claim 3, wherein the step of identifying the user includes using the movement data.
- 25 5. A method according to claim 3, further including the step of receiving, in the computer system, data indicative of the identity of the user.

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13. A method according to any one of claims 1 to 6, wherein the signature field is

associated with a visible signature zone defined on the interface surface.

14. A method according to any one of claims 1 to 6, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data being generated by periodically sampling the acceleration of the sensing device as it is used to sign the signature onto the surface.

15. A method according to claim 14, further including the step of generating movement data in the form of a locus of the sensing device in relation to the surface, the locus being determined by ascertaining relative displacement of the sensing device.

16. A method according to claim 15, wherein the relative displacement is obtained by doubly integrating the acceleration with respect to time.

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17. A method according to claim 15 or 16, wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

18. A method according to any one of claims 1 to 6, wherein position elements are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to draw onto the surface, the method including the step of generating the movement data by ascertaining relative displacement of the sensing means over time with respect to at least one of the position elements.

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19. A method according to claim 18, wherein the position elements are disposed on the surface as a regular array of dots, lines or other formations.

20. A method according to claim 18, wherein the position elements are disposed on the surface stochastically.

21. A method according to any one of claims 1 to 6, wherein the movement data is generated by ascertaining relative rotation of one or more motion sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing device is used to sign the signature thereon.

22. A method according to claim 21, wherein the motion sensing elements include one or more rollerballs mounted for rotation within a constraining housing disposed substantially within the sensing device.

23. A method according to claim 22, wherein components of rotation of the rollerball, due to movement of the sensing device when signing the signature onto the surface, are periodically measured.

24. A method according to claim 23, wherein the components of rotation of the rollerball due to movement of the sensing device by the user when signing the signature onto the surface are measured by means of:

rollers disposed within the constraining housing for rotation, the rollers being configured to be driven by contact with the rotating rollerball; or

optical sensing of rotation of the rollerball with respect to the constraining housing.

25. A method according to any one of claims 1 to 6, wherein the coded data includes at least one tag, each tag being indicative of the signature field.

26. A method according to claim 25, wherein the tags are also indicative of points

within the signature field.

27. A method according to claim 26, wherein each of the tags includes:
first identity data defining a relative position of that tag; and
5 second identity data identifying the signature field.

28. A method according to claim 27, wherein the relative position is defined in
relation to the signature field.

10 29. A method according to claim 27, wherein the relative position is defined in
relation to a plurality of the other tags.

30. A method according to claim 27, wherein the relative position is defined in
relation to the interface surface.

15 31. A method according to claim 27, wherein the first identity data identifies stored
information defining the relative position, the stored information not being stored on the
interface surface.

20 32. A method according to claim 31, wherein the first identity data and the second
identity data together identify stored information defining the relative position.

33. A system for enabling user interaction with computer software running in a
computer system, the system including:

25 an interface surface containing information relating to the computer software
and including coded data indicative of a signature field relating to the computer
software; and

a sensing device which, when placed in an operative position relative to the interface surface, senses indicating data indicative of the signature field and generates movement data indicative of the sensing device's movement;

the system being configured to, in the computer system:

- 5 (a) receive the indicating data from the sensing device;
- (b) receive the movement data from the sensing device;
- (c) identify the signature field on the basis of the indicating data; and
- (d) operate the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.

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34. A system according to claim 33, wherein the computer system is configured to verify that the movement data represents a handwritten signature of the user.

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35. A system according to claim 34, wherein the computer system is configured to identify the user.

36. A system according to claim 35, wherein the computer system is configured to identify the user by using the movement data.

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37. A system according to claim 35, wherein the computer system is configured to receive data indicative of the identity of the user.

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38. A system according to claim 35, wherein the computer system is configured to receive data from storage means of the sensing device, the data being indicative of the identity of the user.

39. A system according to any one of claims 33 to 28, wherein the computer system

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is configured to use a signature key of the user to generate a digital signature of digital content related to the computer software.

40. A system according to claim 39, wherein the computer system is configured to generate a fixed length hash based on the digital content and to encrypt the hash in accordance with the signature key after the signature has been verified, thereby to generate the digital signature.

41. A system according to claim 39 or 40, wherein the digital content is provided by the user.

42. A system according to claim 41, wherein the digital content is based on data input by the user via the sensing device and interface surface.

43. A system according to claim 39, wherein the computer system is configured to associate the digital signature with the signature field.

44. A system according to any one of claims 33 to 38, wherein the computer system is configured to send data to the computer software indicative of at least the signature field.

45. A system according to any one of claims 33 to 38, wherein the signature field is associated with a visible signature zone defined on the interface surface.

46. A system according to any one of claims 33 to 38, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data being generated by periodically sampling the acceleration of the sensing device as it is

used to sign the signature onto the surface.

47. A system according to claim 45, further including the step of generating movement data in the form of a locus of the sensing means in relation to the surface, the
5 locus being determined by ascertaining relative displacement of the sensing device.

48. A method according to claim 47, wherein the relative displacement is obtained by doubly integrating the acceleration with respect to time.

10 49. A system according to claim 47 wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

50. A system according to any one of claims 33 to 38, wherein position elements
15 are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to sign the signature onto the surface, the movement data being generated by ascertaining relative displacement of the sensing means over time with respect to at least one of the position elements.

20 51. A system according to claim 50, wherein the position elements are disposed on the surface as a regular array of dots, lines or other formations.

52. A system according to claim 50, wherein the position elements are disposed on the surface stochastically.

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53. A system according to any one of claims 33 to 38, wherein the movement data is generated by ascertaining relative movement of one or more motion sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing

device is used to sign the signature thereon.

54. A system according to claim 53, wherein the motion sensing elements include one or more rollerballs mounted for rotation within a constraining housing disposed substantially within the sensing device.

55. A system according to claim 54, wherein components of rotation of the rollerball, due to movement of the sensing device when signing the signature onto the surface, are periodically measured.

56. A system according to claim 55, wherein the components of rotation of the rollerball due to movement of the sensing device by the user when signing the signature onto the surface are measured by means of:

rollers disposed within the constraining housing for rotation, the rollers being configured to be driven by contact with the rotating rollerball; or

optical sensing of rotation of the rollerball with respect to the constraining housing.

57. A system according to any one of claims 33 to 38, wherein the coded data includes at least one tag, each tag being indicative of the signature field.

58. A system according to claim 57, wherein the tags are also indicative of points within the signature field.

59. A system according to claim 58, wherein each of the tags includes:
first identity data defining a relative position of that tag; and
second identity data identifying the signature field.

60. A system according to claim 59, wherein the relative position is defined in relation to the signature field.
- 5 61. A system according to claim 59, wherein the relative position is defined in relation to a plurality of the other tags.
62. A system according to claim 59, wherein the relative position is defined in relation to the interface surface.
- 10 63. A system according to claim 59, wherein the first identity data identifies stored information defining the relative position, the stored information not being stored on the interface surface.
- 15 64. A system according to claim 61, wherein the first identity data and the second identity data together identify stored information defining the relative position.
65. A system for enabling user interaction with computer software running in a computer system, the system including:
- 20 an interface surface containing information relating to the computer software and including coded data indicative of a signature field relating to the computer software;
- the system being configured to, in the computer system:
- (a) receive indicating data from a sensing device, the indicating data being
- 25 indicative of the signature field, wherein the sensing device, when placed in an operative position relative to the interface surface, senses the indicating data and generates movement data indicative of the sensing device's movement relative to the interface surface;

- (b) receive the movement data from the sensing device;
- (c) identify the signature field on the basis of the indicating data; and
- (d) operate the computer software at least partly in reliance on the movement data, and in accordance with instructions associated with the signature field.

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66. A system according to claim 65, wherein the computer system is configured to verify that the movement data represents a handwritten signature of the user.

67. A system according to claim 66, wherein the computer system is configured to
10 identify the user by using the movement data.

68. A system according to claim 65, wherein the computer system is configured to receive data indicative of the identity of the user.

15 69. A system according to claim 65, wherein the computer system is configured to receive data from storage means of the sensing device, the data being indicative of the identity of the user.

70. A system according to any one of claims 65 to 69, wherein the computer system
20 is configured to use a signature key of the user to generate a digital signature of digital content related to the computer software.

71. A system according to claim 70, wherein the computer system is configured to associate the digital signature with the signature field.

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72. A system according to any one of claims 65 to 67, wherein the signature field is associated with a visible signature zone defined on the interface surface.

73. A system according to any one of claims 65 to 67, wherein the sensing device includes at least one acceleration measuring device for measuring acceleration of the sensing device as it is used to sign the signature onto the surface, the movement data
5 being generated by periodically sampling the acceleration of the sensing device as it is used to sign the signature onto the surface.

74. A system according to claim 73, wherein the relative displacement is obtained by doubly integrating the acceleration with respect to time.
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75. A system according to claim 73, wherein the acceleration measuring device includes one or more accelerometers configured to measure at least two orthogonal components of acceleration.

15 76. A system according to any one of claims 65 to 67, wherein position elements are disposed on the interface surface, the sensing device being configured to periodically sense position elements as it is used to sign the signature onto the surface, the movement data being generated in the form of a locus of the sensing means in relation to the surface by ascertaining relative displacement of the sensing means with respect to at least one of
20 the position elements.

77. A system according to any one of claims 65 to 67, wherein the movement data is generated by ascertaining relative movement of one or more motion sensing elements rotatably mounted to the sensing device for contact with the surface while the sensing
25 device is used to sign the signature thereon.

78. A system according to any one of claims 65 to 67, wherein the coded data includes at least one tag, each tag being indicative of the signature field.

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